

**WE CLAIM**

1. A method of reassembling packets from a plurality of traffic flows in a network element, each of said packets having at least one data part, said method comprising the steps of:

- 5 (1) queuing each of said at least one data part of said packets of said plurality of traffic flows in a single reassembly queue in a sorted order, said at least one data part of said each of said packets being continuously grouped without data parts of other of said packets being interleaved therein; and
- (2) reassembling said at least one data part of said each of said packets queued in said single reassembly queue.

10 2. A method of reassembling packets as claimed in claim 1, said method further comprising:

- (0.1) an initial step of transmitting said at least one data part of said packets to an egress card of said network element in a packet ordered stream, said at least one data part of said each of said packets being continuously grouped without interleaved data parts of other of said packets

15 and wherein said steps (1) and (2) are performed at said egress card.

3. A method of reassembling packets as claimed in claim 2, wherein:

said traffic flows transmit frames to said network element; and

said step 0.1 further includes substeps:

- 20 (0.1a) queuing said frames of said each of said plurality of traffic flows prior to said transmitting said each of said at least one data part to said egress card; and

(0.1b) segmenting said frames in said plurality of traffic flows into said at least one data part of said packets after said queuing said frames.

4. A method of reassembling packets as claimed in claim 3, wherein:

said network element includes an ingress card; and

5 said substeps (0.1a) and (0.1b) are performed by said ingress card.

5. A method of reassembling packets as claimed in claim 4, wherein each traffic flow of said plurality of traffic flows has a weight and said each traffic flow receives bandwidth on said packet ordered stream based on said weight of said each traffic flow.

6. A method of reassembling packets as claimed in claim 4, wherein each traffic flow of said plurality of traffic flows is associated with a class of traffic flow, said class indicating a priority for said traffic flow.

7. A network element providing datapath connectivity for a plurality of traffic flows, said network element transmitting cells within said network element, said plurality of traffic flows transmitting variable-length packets to said network element, said network element comprising:

15 an ingress card having segmentation module adapted to segment said variable-length packets of said plurality of traffic flows into at least one cell, said ingress card transmitting said cells formed from each of said variable-length packets in a packet ordered stream grouped together in a sorted order; and  
an egress card receiving said cells transmitted in said packet ordered stream, said egress  
20 card having:

an egress queuing module adapted to queue said cells of said variable-length packets of said plurality of traffic flows into a single reassembly queue; and  
a reassembly module adapted to reassemble said cells queued in said single reassembly queue into variable-length packets.

8. A network element providing datapath connectivity for a plurality of traffic flows as claimed in claim 7, wherein said ingress card further has an ingress queuing module adapted to queue said variable-length packets of said plurality of traffic flows into queues at said ingress card of said network element.

9. A network element providing datapath connectivity for a plurality of traffic flows as claimed in claim 8, wherein each traffic flow of said plurality of traffic flows has a weight and said each traffic flow receives bandwidth on said packet ordered stream based on said weight of said each traffic flow.

10. A network element providing datapath connectivity for a plurality of traffic flows as claimed in claim 9, wherein each traffic flow of said plurality of traffic flows is associated with a class of traffic flow, said class indicating a priority for said traffic flow.

11. A method of providing traffic guarantees for a plurality of traffic flows in a network element, each traffic flow of said plurality of traffic flows having a weight, said network element having an ingress card and an egress card, said method comprising:

receiving said plurality of traffic flows at said ingress card in said network element; and

transmitting said plurality of traffic flows to said egress card in said network element  
over a packet stream, a traffic flow of said plurality of traffic flows receiving  
bandwidth on said packet stream based on said weight of said traffic flow.

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